

## ABSTRACT

A method for upstream traffic control in an Ethernet-based passive optical network, adapted for preventing a penalty phenomenon occurring in making upstream data transfer on basis of High Priority First Allocation (HPFA) algorithm. The  
5 method includes the steps of determining whether are any data frames to transfer in the first buffer; if it is determined that there are any data frames to transfer in the first buffer, determining whether the data frame does not exceed a low water mark indicative of a reference value set up to ensure the minimum transfer traffic; if it is determined that the data frame in the first buffer does not exceed the low water mark,  
10 then transferring the data frame stored in the first buffer and determining whether the data frame in a second buffer does not exceed the low water mark; if it is determined that the data frame in the second buffer does not exceed the low water mark, then determining whether the data frame to transfer in a third buffer does not exceed the low water mark; if it is determined that the data frame to transfer in the third buffer  
15 does not exceed the low water mark, then transferring the respective data frame stored in the second and third buffers.